Name: Date:

Polynomial Factoring solution (version 661)

1. **The quadratic formula says if $ax^2 + bx + c = 0$ then $x = \frac{-b \pm \sqrt{b^2-4ac}}{2a}$. Use the quadratic formula to solve the following equation.**

$$x^2 - 8x + 24 = 0$$

Simplify your answer(s) as much as possible.

Solution

$$x = \frac{-(-8) \pm \sqrt{(-8)^2 - 4(1)(24)}}{2(1)}$$

$$x = \frac{-(-8) \pm \sqrt{64 - 96}}{2(1)}$$

$$x = \frac{8 \pm \sqrt{-32}}{2}$$

$$x = \frac{8 \pm \sqrt{-16 \cdot 2}}{2}$$

$$x = \frac{8 \pm 4\sqrt{2}\, i}{2}$$

$$x = 4 \pm 2\sqrt{2}\, i$$

Notice that i in NOT under the square-root radical symbol!!

2. **Express the product of $-7 - 6i$ and $-8 - 3i$ in standard form $(a + bi)$.**

Solution

$$(-7 - 6i) \cdot (-8 - 3i)$$

$$56 + 21i + 48i + 18i^2$$

$$56 + 21i + 48i - 18$$

$$56 - 18 + 21i + 48i$$

$$38 + 69i$$

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3. **Write function $f(x) = x^3 + 2x^2 - 21x + 18$ in factored form. I'll give you a hint: one factor is $(x + 6)$.**

Solution

	1	2	-21	18
-6		-6	24	-18
	1	-4	3	0

$$f(x) = (x + 6)(x^2 - 4x + 3)$$

$$f(x) = (x + 6)(x - 3)(x - 1)$$

4. **Polynomial p is defined below in factored form.**

$$p(x) = -(x + 7)^2 \cdot (x + 3) \cdot (x - 1)^2 \cdot (x - 4)$$

Sketch a graph of polynomial $y = p(x)$.